

WHAT IS CLAIMED AS NEW AND DESIRED TO BE PROTECTED BY  
LETTERS PATENT OF THE UNITED STATES OF AMERICA, IS:

1. A mail article transportation and stabilization system, for use in conjunction with a camera-based scanning system whereby clear, accurate, and complete scanning, imaging, and reading of address information, contained upon a plurality 5 of mail articles, can be achieved, comprising:

    a housing comprising a front surface;  
    a camera fixedly disposed within said housing and comprising a camera view port defined within said front surface of said housing and across which a plurality of mail 10 articles are to be serially conveyed;  
    a conveyor belt for serially conveying the plurality of mail articles across said camera view port of said camera in a longitudinal direction such that information contained upon the plurality of mail articles can be scanned, imaged, and read by said camera; and  
    air plenum means defined within said housing for generating air streams defining an air bearing layer upon which said conveyor belt, and the plurality of mail articles being conveyed by said conveyor belt, can be conveyed in a 15 substantially smooth, frictionless, and jitter-free manner such that said camera can scan, image, and read the information contained upon the plurality of mail articles in an accurate, clear, and complete manner.

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2. The system as set forth in Claim 1, wherein:

said camera comprises an optical character recognition (OCR) type camera.

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3. The system as set forth in Claim 1, wherein:

said camera comprises a bar code reader (BCR) type camera.

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4. The system as set forth in Claim 1, further comprising:

15 a pair of conveyor belt rollers around which said conveyor belt is routed such that said conveyor belt comprises an outer run section, disposed remote from said front surface of said housing and said camera view port, and an inner run section disposed adjacent to said front surface of said housing and said camera view port.

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5. The system as set forth in Claim 4, wherein:

said housing has a predetermined longitudinal extent; and

25                   said pair of conveyor belt rollers are disposed at  
longitudinal extremes of said housing such that no conveyor  
belt components, other than said inner run section of said  
conveyor belt, are disposed in contact with said front sur-  
face of said housing and said camera view port whereby said  
30 inner run section of said conveyor belt can be conveyed  
across said front surface of said housing upon said air

bearing layer in a substantially frictionless manner.

5 6. The system as set forth in Claim 1, wherein:

      said inner run section of said conveyor belt has a substantially planar configuration defining a conveyance plane for the plurality of mail articles; and

10       said front surface of said housing has a substantially curvilinear configuration such that a first upstream end portion of said front surface of said housing diverges away from said conveyance plane of said inner run section of said conveyor belt and thereby defines therewith an entrance slot within which air discharged from said air plenum means defined within said housing causes the plurality of mail articles to be aerodynamically lifted into engagement with said inner run section of said conveyor belt, while a second downstream end portion of said front surface of said housing likewise diverges away from said conveyance plane of said inner run section of said conveyor belt and thereby defines therewith an exit slot within which air discharged from said air plenum means defined within said housing causes the plurality of mail articles to experience aerodynamic lift so as to thereby be maintained in engagement with said inner run section of said conveyor belt.

25 7. The system as set forth in Claim 1, wherein:

30       said housing has a predetermined vertical extent; and

5 said air plenum means comprises at least one apertured strip from which said air streams are generated, said at least one apertured strip having a predetermined vertical extent which is less than said predetermined vertical extent of said housing.

8. The system as set forth in Claim 7, wherein:

10 said air streams generated from said at least one apertured strip of said air plenum means are characterized by means of an air pressure value which is substantially less than atmospheric pressure; and

15        said at least one apertured strip, having said predetermined vertical extent which is less than said predetermined vertical extent of said housing, is located at a substantially central vertical location within said housing such that ambient atmospheric pressure zones are disposed above and below said sub-atmospheric air streams generated from said air plenum means so as to confine said sub-atmospheric air streams to predetermined locations for acting 20 upon the plurality of mail articles.

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9. The system as set forth in Claim 4, wherein:

at least one of said conveyor belt rollers comprises a drive roller; and

30 a servo drive motor is operatively connected to  
said at least one conveyor belt drive roller.

10. A mail article transportation and stabilization system, for use in conjunction with a camera-based scanning system whereby clear, accurate, and complete scanning, imaging, and reading of address information, contained upon a plurality of mail articles, can be achieved, comprising:

a housing comprising a front surface;

a camera fixedly disposed within said housing and comprising a camera view port defined within said front surface of said housing and across which a plurality of mail

5 articles are to be serially conveyed in a longitudinal direction such that information contained upon the plurality of mail articles can be scanned, imaged, and read by said camera; and

10 air plenum means defined within said housing for generating an air bearing layer upon which the plurality of mail articles being conveyed can be conveyed in a substantially smooth, frictionless, and jitter-free manner such that said camera can scan, image, and read the information contained upon the plurality of mail articles in a clear, 15 accurate, and complete manner.

11. The system as set forth in Claim 10, wherein:

20 said camera comprises an optical character recognition (OCR) type camera.

25 12. The system as set forth in Claim 10, wherein:

said camera comprises a bar code reader (BCR) type

camera.

5 13. The system as set forth in Claim 1, further comprising:  
a conveyor belt, for conveying the plurality of  
mail articles across said camera view port, comprising an  
outer run section, disposed remote from said front surface  
of said housing and said camera view port, and an inner run  
10 section disposed adjacent to said front surface of said  
housing and said camera view port.

15 14. The system as set forth in Claim 13, wherein:  
only said inner run section of said conveyor belt,  
is disposed in contact with said front surface of said hous-  
ing and said camera view port whereby said inner run section  
of said conveyor belt can be conveyed across said front sur-  
20 face of said housing upon said air bearing layer in a sub-  
stantially frictionless manner.

25 15. The system as set forth in Claim 10, wherein:  
said inner run section of said conveyor belt has a  
substantially planar configuration defining a conveyance  
plane for the plurality of mail articles; and  
said front surface of said housing has a substan-  
30 tially curvilinear configuration such that a first upstream  
end portion of said front surface of said housing diverges

away from said conveyance plane of said inner run section of said conveyor belt and thereby defines therewith an entrance slot within which air discharged from said air plenum means defined within said housing causes the plurality of mail articles to be aerodynamically lifted into engagement with said inner run section of said conveyor belt, while a second downstream end portion of said front surface of said housing likewise diverges away from said conveyance plane of said inner run section of said conveyor belt and thereby defines therewith an exit slot within which air discharged from said air plenum means defined within said housing causes the plurality of mail articles to experience aerodynamic lift so as to thereby be maintained in engagement with said inner run section of said conveyor belt.

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16. The system as set forth in Claim 10, wherein:

20 said housing has a predetermined vertical extent; and

25 said air plenum means comprises at least one apertured strip from which said air streams are generated, said at least one apertured strip having a predetermined vertical extent which is less than said predetermined vertical extent of said housing.

17. The system as set forth in Claim 16, wherein:

30 said air streams generated from said at least one apertured strip of said air plenum means are characterized

by means of an air pressure value which is substantially less than atmospheric pressure; and

5                   said at least one apertured strip, having said predetermined vertical extent which is less than said predetermined vertical extent of said housing, is located at a substantially central vertical location within said housing such that ambient atmospheric pressure zones are disposed above and below said sub-atmospheric air streams generated from said air plenum means so as to confine said sub-atmospheric air streams to predetermined locations for acting 10 upon the plurality of mail articles.

15 18. The system as set forth in Claim 13, wherein:

                  said conveyor belt is routed around a pair of rollers at least one of which comprises a drive roller; and a servo drive motor is operatively connected to said at least one conveyor belt drive roller.

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19. A method for transporting mail articles, in order to obtain clear, accurate, and complete scanning, imaging, and 25 reading of address information contained upon a plurality of mail articles, comprising the steps of:

                  fixedly disposing a camera within a housing such that a camera view port is defined within a front surface of said housing;

30                   serially conveying a plurality of mail articles along a flow path which extends across said camera view port

of said camera such that information contained upon the plurality of mail articles can be scanned, imaged, and read by said camera; and

generating air streams from said housing for defining an air bearing layer upon which the plurality of mail articles can be conveyed in a substantially smooth, frictionless, and jitter-free manner such that said camera can scan, image, and read the information contained upon the plurality of mail articles in a clear, accurate, and complete manner.

20. The method as set forth in Claim 19, comprising the additional step of:

providing said front surface of said housing with a substantially curvilinear configuration such that a first upstream end portion of said front surface of said housing diverges away from said article flow path and thereby defines therewith an entrance slot within which said generated air discharged from said housing causes the plurality of mail articles to be conveyed in an aerodynamically lifted manner along said article flow path so as to establish said substantially smooth, frictionless, and jitter-free conveyance of the plurality of mail articles along said article flow path, while a second downstream end portion of said front surface of said housing likewise diverges away from said article flow path and thereby defines therewith an exit slot within which said generated air discharged from said housing causes the plurality of mail articles to be conveyed in an aerodynamically lifted manner along said article flow

path so as to maintain said substantially smooth, frictionless, and jitter-free conveyance of the plurality of mail articles along said article flow path.

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